

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2000-044887**

(43)Date of publication of application : **15.02.2000**

(51)Int.Cl.

C09J 4/00

(21)Application number : **11-200089**

(71)Applicant : **NATL STARCH & CHEM
INVESTMENT HOLDING
CORP**

(22)Date of filing : **14.07.1999**

(72)Inventor : **WALLACH ROBERT S
EDELMAN ROBERT**

(30)Priority

Priority number : **98 115063** Priority date : **14.07.1998** Priority country : **US**

(54) UV CURABLE PRESSURE SENSITIVE ADHESIVE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain the subject adhesive being a liquid at an ambient temperature, and cured by ultraviolet rays to exhibit a good peeling strength from a high to a low temperature by containing a specific polyacrylate, vinyl ether and an onium salt photo initiator in each specific ratio.

SOLUTION: This UV curable pressure sensitive adhesive contains (A) 60-90 pt.wt. polyacrylate having a pendant part, (B) 10-40 pt.wt. vinyl ether and (C) 1-4 pt.wt. onium salt photo initiator based on 100 pts.wt. component (A). The component (B) is preferably has a low viscosity and (-)50-(+)10°C Tg value, and e.g. butyl vinyl ether, ethylhexylvinyl ether, etc., can be cited. Also, the component (C) is preferably sulfonium hexafluoroantimonate. Thereby, it is possible to obtain an adhesive being a liquid at an ambient temperature, and cured by ultraviolet rays to exhibit a good peeling strength over 85-(-)40°C.

CLAIMS

[Claim(s)]

[Claim 1](i) A UV curing nature adhesive composition which contains an onium salt photoinitiator of one to 4 weight section to 60 to polyacrylate 90 weight section which has a photosensitive pendant portion, ten to (ii) vinyl ether 40 weight section, (iii) polyacrylate, and 100 weight sections of vinyl ether.

[Claim 2]The adhesive composition according to claim 1 in which polyacrylate is chosen from a group of polyacrylate currently sold by BASF A.G. by trade name AKURONARU 3429 and AKURONARU 3458.

[Claim 3]The adhesive composition according to claim 1 in which vinyl ether has low viscosity and Tg value of -50-+10 **.

[Claim 4]Vinyl ether Butylvinyl ether, ethylhexyl vinyl ether, The adhesive composition according to claim 1 chosen from a group which consists of ethyl vinyl ether, isopropylvinyl ether, cyclohexylvinyl ether, isobutylvinyl ether, and hydroxybutylvinyl ether.

[Claim 5]The adhesive composition according to claim 1 whose photoinitiator is hexafluoro antimonium acid sulfonium.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]The pressure sensitive adhesive is used for various uses for the ease of handling, and the moment adhesive property. Although there is material which can be used at either an elevated temperature or low temperature, the material which can be used in both environment of these has not been established yet. For example, to provide the pressure sensitive adhesive which can be used for autoclaves within a hood is desired. However, at low temperature, the material which gives adhesion firm enough at an elevated temperature embrittles, and loses an adhesive property. On the other hand, at an elevated temperature, it softens and the material which has intensity and pliability at low temperature becomes vulnerable.

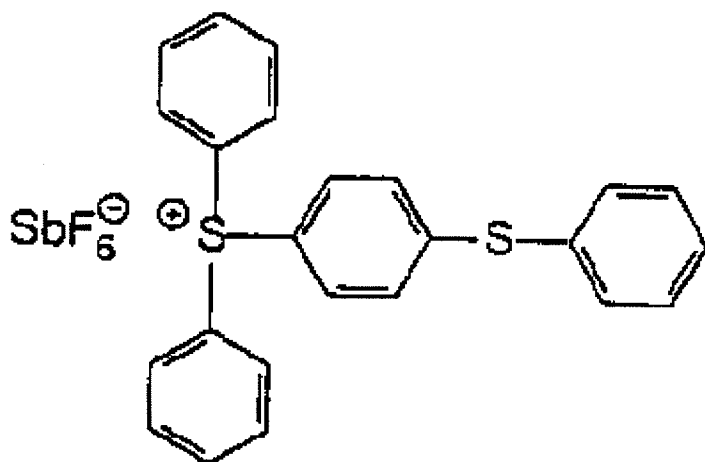
[0002]This invention is a UV curing nature adhesive composition containing the polyacrylate which has a photosensitive pendant portion, vinyl ether, and an onium salt photoinitiator. This constituent is a fluid in ambient air temperature, and is a pressure sensitive adhesive in which it hardens by ultraviolet rays and good peel strength is shown over 85--40 **.

[0003]Polyacrylate is a saturation polymer chain manufactured from an acrylate monomer, and this chain also contains a photosensitive pendant portion. A photosensitive pendant group is combined with polyacrylate by combination of sufficient length to promote intermolecular association. Generally this polymer has the weight average molecular weight of 2,000-10,000. Desirable polyacrylate is sold by BASF A.G. by trade name AKURONARU(ACRONAL)3429 and AKURONARU 3458. Polyacrylate will recognize 60-90 weight-section existence into the constituent of 100 weight sections.

[0004]Desirable vinyl ether has low viscosity and has Tg value which is -50-+10 **. Especially desirable vinyl ether is C₄ - C₁₀ vinyl ether. This ether can also contain a hydroxy group. The examples of vinyl ether are butylvinyl ether, ethylhexyl vinyl ether, ethyl vinyl ether, isopropylvinyl ether, cyclohexylvinyl ether, isobutylvinyl ether, and hydroxybutylvinyl ether. More desirable vinyl ether is butylvinyl ether. Vinyl ether will recognize 10-40 weight-section existence into the constituent of 100 weight sections.

[0005]Desirable onium salt photoinitiators are the diaryliodonium salt in which starting cation hardening is known, a triarylsulfonium salt, and a ferro SENIUMU salt. Such salts are explained by United States patent 4,069,055th and No. 4,058,401 (Crivello) in full detail. Desirable onium salt is hexafluoro antimonium acid sulfonium of the following structural formula which can be obtained from Union Carbide. : [0006]

[Formula 1]



[0007] Probably these initiators exist in an arbitrary quantity effective in the start of a curing process, and, generally 0.1 to ten weight sections exist in the quantity of one to 4 weight section preferably per polyacrylate and vinyl ether 100 weight section.

[0008]

[Example] Several sorts of adhesive compositions by this invention were manufactured, and a typical UV curing nature adhesives system and type as follows compared peel strength. The class product was given to the miler (Mylar) base material, and it glared for 3 seconds by the ultraviolet rays from the fusion (Fusion) UV system of 300W, and D type electric bulb. The base material suited 6 cm from the light source. Subsequently, it was pasted mutually, having applied a 5-pound platen to the hardened covering film, and it was made the adhesion laminated piece. Subsequently, it cut by making this laminated piece into 180-degree friction tests to a section 2.54 cm (1 inch) in width, and 15.24 cm (6 inches) in length. The friction test was carried out with the Instron tension unit.

[0009] The result of the presentation of a sample and a peel strength examination is shown in Table 1. The presentation of a sample is expressed with a weight section. IRGACURE (Irgacure) is a trade name of the standard photoinitiator which can be obtained from Ciba-Geigy. n/m reports a peel strength value. The sample constituents A and B are this invention samples, and C and D are compounds standard as UV curing nature adhesives.

[0010]

[Table 1]

組成 重量部	A	B	C	D
ア ク ロ ナ ル 3429	75	75	75	75
ブチルビニルエーテル	25			
エチルヘキシルビニルエーテル		25		
アクリル酸エチルヘキシル			25	
アクリル酸テトラヒドロフルフリル				25
ヘキサフルオロアンチモン酸 スルホニウム	1	1		
イルガキュア1173			1	1
剥離値 N/m				
-40℃	400	550	400	350
22℃	800	850	250	300
85℃	530	450	50	70

[0011]These data shows that the case where the sample constituent A and B per peel strength are standard compounds is excelled.

EXAMPLE

[Example]Several sorts of adhesive compositions by this invention were manufactured, and a typical UV curing nature adhesives system and type as follows compared peel strength. The class product was given to the miler (Mylar) base material, and it glared for 3 seconds by the ultraviolet rays from the fusion (Fusion) UV system of 300W, and D type electric bulb. The base material suited 6 cm from the light source. Subsequently, it was pasted mutually, having applied a 5-pound platen to the hardened covering film, and it was made the adhesion laminated piece. Subsequently, it cut by making this laminated piece into 180-degree friction tests to a section 2.54 cm (1 inch) in width, and 15.24 cm (6 inches) in length. The friction test was carried out with the Instron tension unit.

[0009]The result of the presentation of a sample and a peel strength examination is shown in Table 1. The presentation of a sample is expressed with a weight section. IRGACURE (Irgacure) is a trade name of the standard photoinitiator which can be obtained from Ciba-Geigy. n/m reports a peel strength value. The sample constituents A and B are this invention samples, and C and D are compounds standard as UV curing nature adhesives.

[0010]

[Table 1]

組成 重量部	A	B	C	D
アクロナル3429	75	75	75	75
ブチルビニルエーテル	25			
エチルヘキシルビニルエーテル		25		
アクリル酸エチルヘキシル			25	
アクリル酸テトラヒドロフルフリル				25
ヘキサフルオロアンチモン酸 スルホニウム	1	1		
イルガキュア1173			1	1
剥離値 N/m				
-40℃	400	550	400	350
22℃	800	850	250	300
85℃	530	450	50	70

[0011]These data shows that the case where the sample constituent A and B per peel strength are standard compounds is excelled.